"Corrected"

Amendments to the Specification

Please amend the paragraph [0004] beginning on page 1, as follows:

[0004] Generally, near-infrared light is a low-energy magnetic wave which means absorption coefficient is too small to be subject to scattering. It means that the use of such a low-energy magnetic wave does not alter nor damage the basic characteristics of the materials or sample under scrutiny.

Please amend the paragraph [0010] beginning on page 2, as follows:

[0010] A method of the present invention related to claim 1 in order to realize the above object is a visible/near infrared spectrometry comprising following steps of:

irradiating a sample specimen with visible light and/or near-infrared light in the wavelength range from 400 nm to 2500 nm or in part of that range.

analyzing the spectra of transmitted light, reflected light, and/or transmitted/reflected light obtained from the sample specimen;

determining the presence and/or measuring the characteristics of respective specific components present in said sample specimen,

Wherein wherein said method further comprises steps of;

measuring spectra while giving predetermined conditions including at least 3 times repeated irradiations as conditions to generate transitional changes of spectral response pattern while activating water existing within and/or around said sample specimen to promote interaction between water molecules and predetermined component included in said sample specimen;

conducting spectral and/or multivariate analysis to detect transitional changes in spectral response patterns;

building a model assuming that components of known sample specimen can be determined

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and/or a model assuming that characteristics of said components can be measured using the detected transitional changes of the spectral response patterns;

conducting the same spectral and/or multivariate analysis on unknown(new) sample specimen while giving the same conditions as said predetermined conditions: and,

comparing with the built models to predict components of unknown sample specimen and/or characteristics of the components.

~~perturbations by adding predetermined specific conditions to the sample specimen,~~

~~building a model assuming that distinction of respective components and/or characteristics of the components can be measured by conducting spectral analysis and/or multivariate analysis.~~

Please amend the paragraph [0011] beginning on page 2, as follows:

[0011]   According to the previous claim 1, the invention makes it possible to establish a model of the correlations of transitional changes arising from adding predetermined conditions while acquiring spectra, and the spectral response to those changes, a feat that has conventionally been difficult to measure. Furthermore, the method makes it possible to measure the concentration of specific components as well as granule diameter. And causes extremely small alterations in the sample specimen and thus makes it possible to detect and measure very small changes caused by specific components when giving specific predetermined conditions and conducting spectral and/or multivariate analysis. The transitional changes of the spectral response patterns of water molecules on the spectral graph are so small that they cannot be detected by the human eye but the invention presented here enables high-accuracy determination of component characteristics and further detection of ultra-low concentrations of those components in real time. ~~specific perturbations, and the spectral response to those changes, a feat that has conventionally been difficult to measure. Furthermore, the method makes it possible to measure the concentration of specific components as well as granule diameter.~~

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Please delete the paragraphs [0012] and [0013] beginning on page 3:

Please amend the paragraph [0014] beginning on page 4, as follows:

[0014]   In the invention related to claim 3, <u>said predetermined condition changes are</u> <u>perturbations (water activating perturbations: WAP) to induce physical or chemical changes to</u> <u>said sample specimen by activating water existing within and/or around said sample specimen,</u> <u>and the perturbations are any one or a combination of at least 3 times repeated light irradiations,</u> <u>change of sample specimen concentration, extension of irradiation time, electromagnetic force</u> <u>application, light path-length changes, temperature changes, pH changes, and pressure changes.</u> ~~the perturbations generate physical and/or chemical changes by adding one or more condition~~ ~~changes like repeated light irradiations, change of sample specimen concentration, extension of~~ ~~irradiation time, electromagnetic force application, light path-length changes, temperature~~ ~~changes, pH changes, and pressure changes.~~

Please amend the paragraph [0015] beginning on page 4, as follows:

[0015]   According to the previous claim 3, this invention makes it also possible to select predetermined <u>one or/and more</u> Water Activated Perturbations (WAP) according to specific types of sample specimens.

Please amend the paragraph [0016] beginning on page 4, as follows:

[0016]   In the invention related to claim 4, <u>the concentrations of sample specimen are changed</u> <u>in step value by a factor of 10 (e.g. 10^{-1} to 10^{-10}) to promote interaction between water and</u> <u>predetermined components, and respective concentrations are subjected to at least 3 times</u> <u>repeated irradiations to promote an interaction between water and the predetermined</u> <u>components.</u> ~~the perturbations are a combination of the repeated light irradiations, and the change~~

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of sample specimen concentrations are changed in order of every tenfold step (e.g. 10^{-1} to 10^{-10}), and said repeated light irradiations must be consecutive repeated at least 3 times.

Please amend the paragraph [0024] beginning on page 5, as follows:

[0024]   In the invention related to claim 8, spectrometry is conducted while giving perturbations in which sample specimen concentrations are changed in step values <u>by a factor of 10</u> and the respective changes changed samples are then subjected to consecutive irradiations, to measure antigen concentrations in the sample specimen.

Please amend the paragraph [0025] beginning on page 5, as follows:

[0025]   According to the previous claim 8, the model can be built in such a way that the detection and measurement of antigens concentrations when present in the specimen sample by giving a perturbation(WAP) in which sample specimen concentrations are changed in step values <u>(by a factor of 10)</u> and a perturbation (WAP) in which respective changes changed samples are subjected to consecutive irradiations of plural times.

Please amend the paragraph [0028] beginning on page 6, as follows:

[0028]   In the invention related to claim 10, the detection of bacteria in the sample specimen is achieved through spectroscopy conducted while giving perturbations in which sample specimen concentrations are changed in step values <u>by a factor of 10</u> and at least 3 consecutive irradiations.

Please amend the paragraph [0029] beginning on page 6, as follows:

[0029]   According to the previous claim 10, the model can be built in such that even very low concentrations of different bacteria types can be detected by giving WAP perturbations as concentration changes (by a factor of 10) and subjecting the sample to consecutive irradiations of plural times.

Please amend the paragraph [0031] beginning on page 6, as follows:

[0031]   According to the previous claim 11 the model can be built in such a way that biological information of mammals such as cows can be obtained easily by evaluating and/or measuring component concentrations of blood plasma and rumen juice through spectrometry of row raw milk from mammals such as cows while giving WAP perturbations to the milk samples under investigation performed at different measurement intervals and measurement number of times (consecutive irradiations).

Please amend the paragraph [0038] beginning on page 7, as follows:

[0038]   A visible/near-infrared spectrometry device used in the present invention and related to claim 15 include:

a near-infrared light generating means capable of irradiating a sample specimen with near-infrared light or visible and/or near-infrared light in the wavelength range from 400 nm to 2500 nm or part of that range;

an optical means for irradiating said visible light and/or near-infrared light to the sample specimen;

a detecting means for obtaining spectra of transmitted light, reflected light, or transmitted/reflected light from said sample specimen; and

a data processing means for conducting a predetermined multivariate analysis on obtained

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spectra,

wherein the visible/near-infrared spectrometry device further comprises: a perturbation giving means for giving perturbations by adding predetermined ~~conditions to said sample specimen;~~ condition changes to the sample to generate transitional changes in spectral response of activated water existing within and/or around said sample specimen to promote interaction between water molecules and specific component included in said sample specimen; and

said data processing means conducting a spectral analysis on all or a part of the wavelength range of spectral responses obtained by giving perturbations.

Please amend the paragraph [0040] beginning on page 8, as follows:

[0040]   In the invention related to claim 16, said perturbation giving means ~~promotes interaction between water molecule and predetermined specific component included in said sample specimen by giving perturbations (WAP) to activate water existing within and/or around said sample specimen,~~ exposes the sample specimen to water activating perturbations (WAP) to induce physical or chemical changes to said sample specimen by activating water existing within and/or around said sample specimen, and comprises an irradiation controlling unit for controlling irradiation time and irradiation frequency is provided.

Please amend the paragraph [0054] beginning on page 10, as follows:

[0054]   The water molecule is the smallest, and it should be the most active and mobile of all molecules. And practically all materials contain at least a small amount of water. So ~~When~~ when a liquid sample (a water contained sample) specimen is irradiated with near-infrared light only specific wavelengths are absorbed by specific types of molecules present in the sample under scrutiny. Furthermore, absorbed wavelength changes vary according to the type of molecular structure. In the case of samples containing water molecules, the absorption phenomenon occurs in the wavelength range specific to the water molecule. The element peaks of water molecules

shift as a result of interaction between that water molecule and the target component present in the sample specimen.

Please amend the paragraph [0070] beginning on page 14, as follows:

[0070]   FIG. 5 shows a contour representing intensity changes (synchronous changes, that is, changes occurring simultaneously) in the water absorbance band ranging from 600 to 850 nm which are specific to the water molecules where changes in absorbance corresponding to the before-mentioned overtones and combination tones easily occur. Furthermore, FIG. 6 shows characteristic spectral peaks (peaks generated by positive correlation and peaks generated by negative correlation). It also shows that with respect to the peak at wavelength 606 nm, positive correlation peaks are simultaneously generated at the wavelengths between 640 nm and 738 nm. Negative correlation peaks are generated at a wavelength of 808 nm. These changes are induced by consecutive illuminations added to the sample specimen.

Please amend the paragraph [0091] beginning on page 18, as follows:

[0091]   When comparing A4 and A8, two different results for interclass distances have been obtained depending on what samples have been used to build up the models. The interclass distance for A4 is 1.156 while the interclass distance in the case of not adding the same samples further diluted with water at various concentrations to the samples obtained by serial dilution with peptone buffer solution is 4.132, which shows that the determination power is increased.the model is obtained by previously diluted samples or not. The interclass distance for A4 is 1.156 while the interclass distance in the case of a previously diluted sample is 4.132, which shows that the determination power is increased. As for obtaining the various concentrations, there are two methods. In the first method, the concentration of each sample is set at a predetermined original value which is being prepared by addition of predetermined amount of water and/or buffer peptone water to an undiluted sample (henceforth referred to as single or serial pre-addition

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dilution). In the second method, the undiluted stock solution is measured as a sample and, after the completion of the measurement; water and/or buffer peptone water are ~~progressively~~ added to dilute the concentration (herein after referred to as multiple and post-addition dilution). In this process, bacteria can be detected by using pre-addition dilution to extremely low concentration levels. Furthermore, in comparing A8 and A6, differences are observed according to whether irradiation is conducted one time or three times. The interclass distance of A6 after three times irradiations is 4.254 and it also shows that the determination power is increased.

Please amend the paragraph [0127] beginning on page 25, as follows:

[0127]   Embodiment 6 is an example of measuring the diameter of granule to be dissolved in sample specimens, before dissolution. In this embodiment, coffee granule diameters are measured before dissolution. Coffee granules are gradually refined through grinding times extending from 0 seconds, 20 seconds, 60seconds, to 90seconds when instant coffee is ground with a mixer. Samples whose concentrations are serially changed (pre-addition dilution) to 4%, 3%, 1% are injected in a silica cell. The silica cell is then irradiated 3 consecutive times with light in the wavelength range of 400 nm to 2500 nm and a light path-length of 1 mm.

Please amend the paragraph [0144] beginning on page 28, as follows:

[0144]   ~~FIG~~ FIGS. 26 and 27 show the results of such analysis. FIG. ~~27~~ 26(a) and (b) show the results obtained for several components assumed to be present in cow milk(Fat, Crude Protein, Casein, True protein and milk urea nitrogen: MUN, Lactose), at different concentration levels, through measurements taken from a cow's blood plasma spectra. FIG. ~~27~~ 26(c) and (d) show results obtained several blood plasma components assumed to be present in blood plasma(Albumin, Glucose, Blood urea nitrogen: BUN)through measurements taken from cow milk spectra instead.